Applicant: Randal Raymond Stark; Dkt. No. 24-NS-6020; Serial No. 09/634,434;
Title: SYSTEMS AND METHODS FOR MANAGING ASSETS USING AN INTERACTIVE DATEBASE; Attorney: John S. Beulick; Armstrong Teasdale LLP, One Metropolitan Square, St. Louis, MO 63102 (314) 621-5070

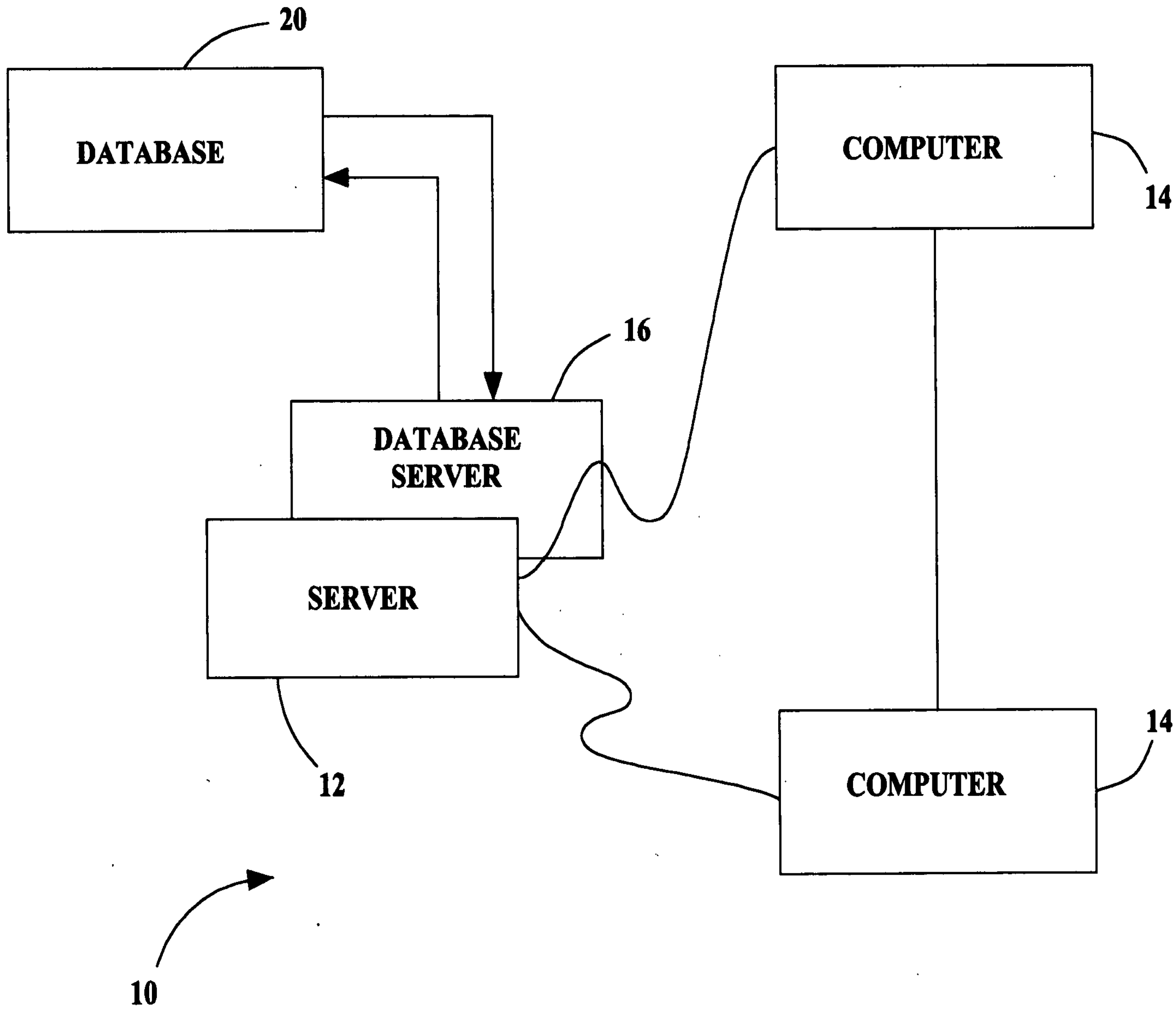

FIG. 1

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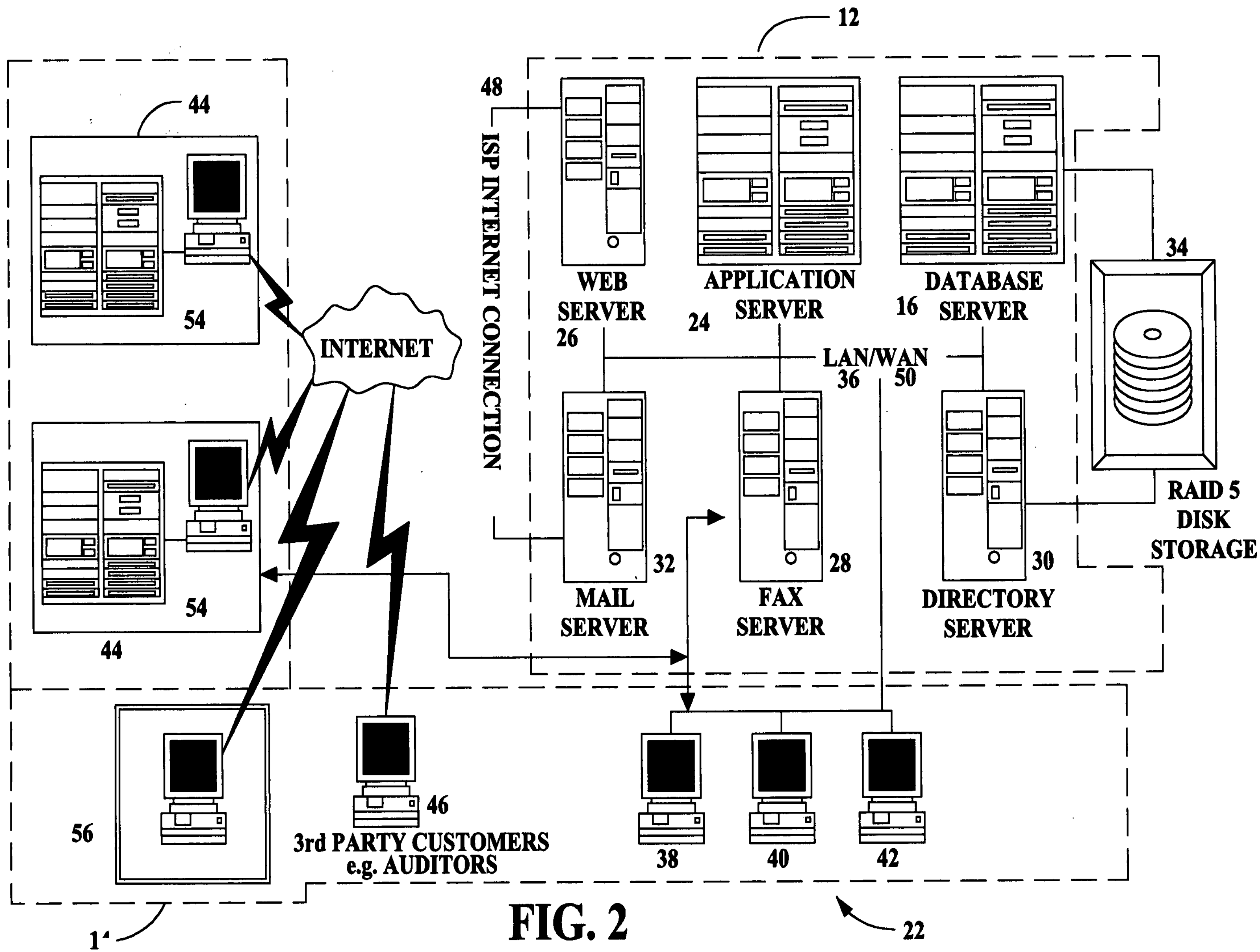
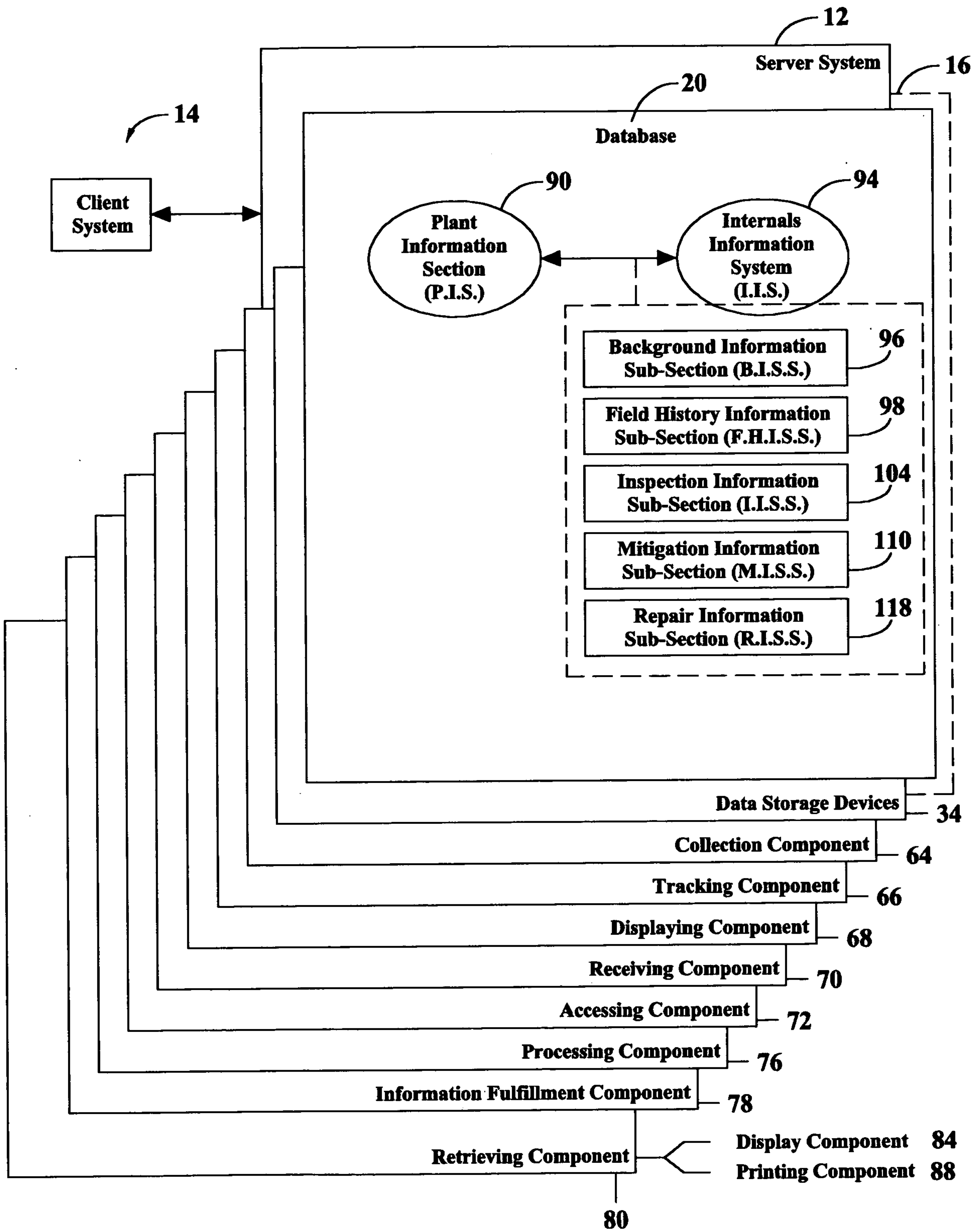


FIG. 2


12
Server System
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Plant Information Section (P.I.S.)
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Internals Information System (I.I.S.)
Background Information Sub-Section (B.I.S.S.)
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Field History Information Sub-Section (F.H.I.S.S.)
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Mitigation Information Sub-Section (M.I.S.S.)
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FIG. 3

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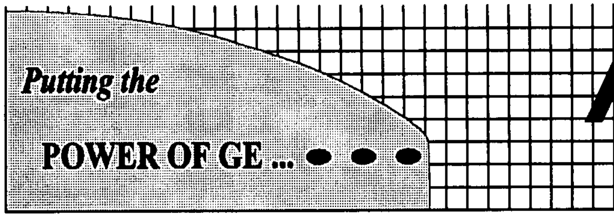
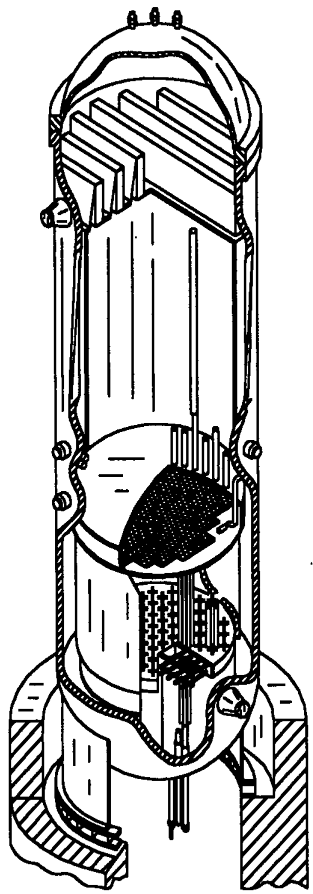


Asset Management



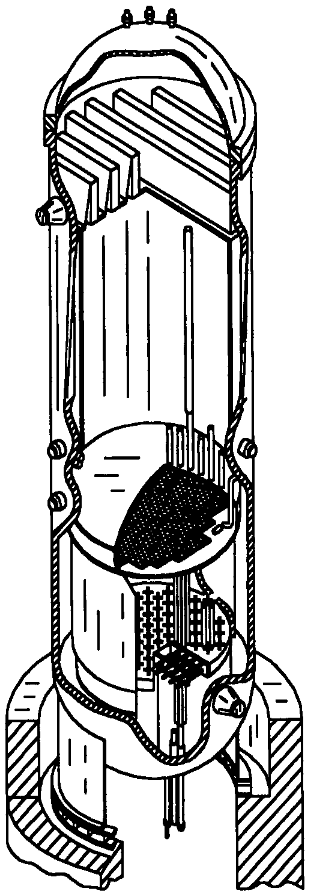
Welcome to the Asset Management Program.

Please choose one of the following plants:

- 310 Dresden 2
- 312 Dressden 3
- 316 LaSalle 1
- 320 LaSalle 2
- 324 Quad Cities 1
- 328 Quad Cities 2

300

FIG. 4



You have chosen to review the Dresden 2 Asset Management Program.

Please choose one of the following internal components:

- Core Spray Internal Piping 344
- Core Spray Sparger 350
- Lower Plenum 354
- Shroud 356
- Shroud Support & Access Hole Cover 368 360
- Jet Pump Diffuser 364
- Jet Pump Riser & Riser Brace 368 370
- Jet Pump Inlet Mixer 374
- Jet Pump Sensing Line 378
- Top Guide 380
- Core Plate 384

340

FIG. 5

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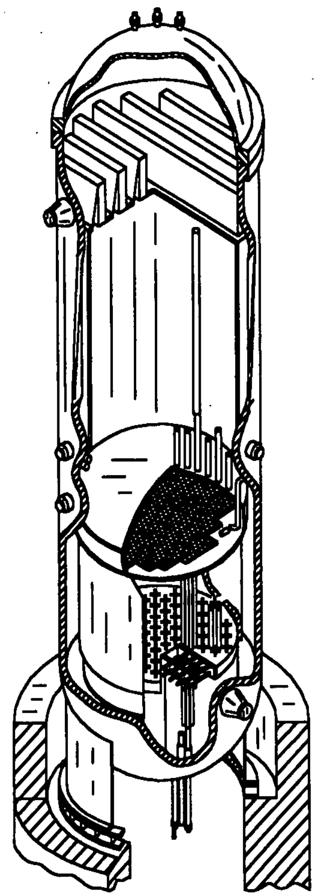

You have chosen to review the La Salle 1 Asset Management Program.

Please choose one of the following internal components:

- Core Spray Internal Piping 404
- Core Pray Sparger 410
- Lower Plenum 414
- Shroud 416
- Shroud Support 418 & Access Hole Cover 420
- Jet Pump Diffuser 424
- Jet Pump Riser 428 & Riser Brace 430
- Jet Pump Inlet Mixer 434
- Jet Pump Sensing Line 438
- LPCI 440
- Top Guide 442
- Core Plate 444

400

FIG. 6

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Core Spray Internal Piping

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458 • **Susceptibility**

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460 • **BWR Fleet**

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470 • **Inspection Experience**

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478 • **Methods**

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Depending on what is chosen on the left hand side, the following may be shown in this area:

Configuration Drawings

Tables

Text

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FIG. 7

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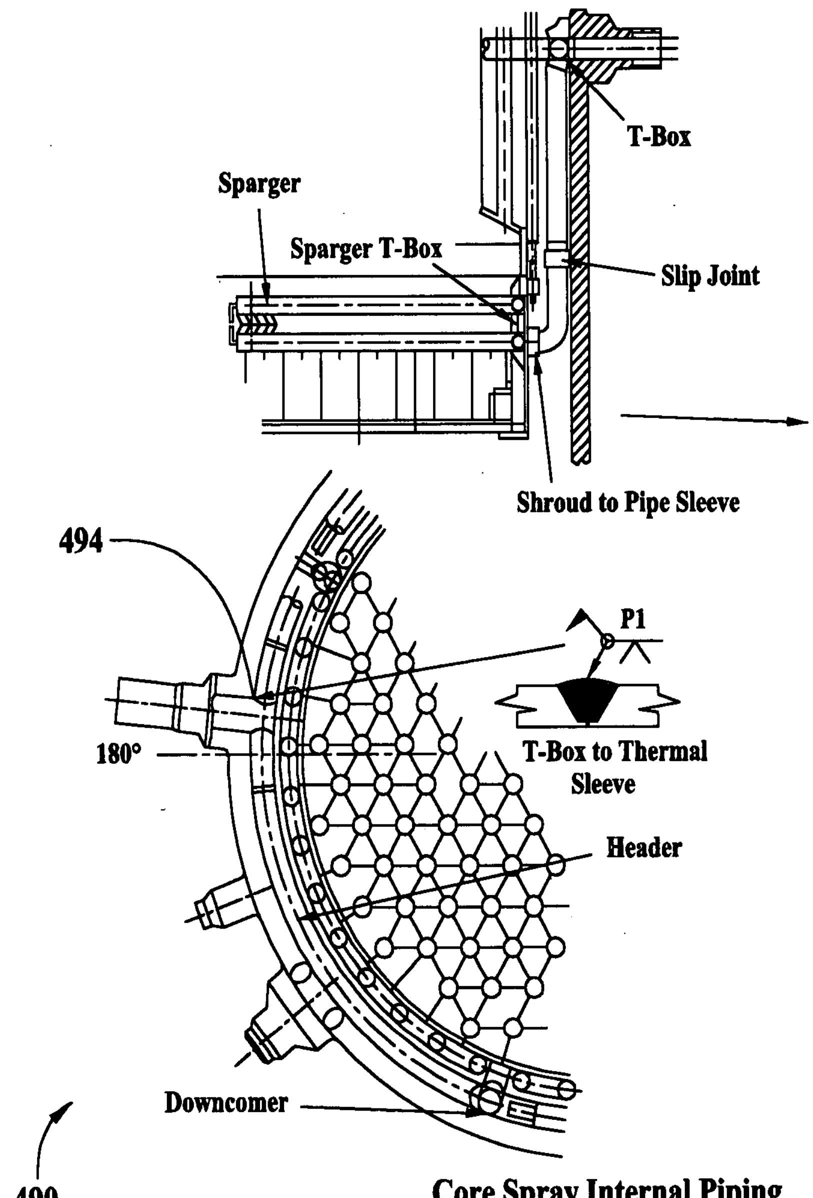

FIG. 8

Core Spray Internal Piping

There will be an active link on the weld callouts which takes the user to a table which gives a description of the weld and the susceptibility of the weld

The user can navigate to any of X figures having to do with this component. The current figure will be highlighted.

Figure 1 2 3 ... X

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Weld ID	Weld Description	Base Material	Filler Material	Susceptibility # (1 = Low; 5 = High)
P1	Thermal sleeve to T-box (field weld)	T-box: 304 SST Unit 2 Thermal Sleeve 304L SST Unit 3 Thermal Sleeve 304 SST	ER308 or, ER308L	3
P2	T-box cover to T-box (field weld with a creviced root)	T-box: 304 SST T-box Plug: 304 SST	ER308 or, ER308L	4
P3	Pipe to T-box (unfavorable weld geometry, installation cold spring likely)	Pipe: 304 SST T-box: 304 SST	ER308 or, ER308L	3
P4a, b, c, d	Elbow to pipe welds (P4c & P4c shop, other field)	Elbow: 304 SST Pipe: 304 SST	Field welds ST filler of an unknown specification: shop welds ER 308 or, ER308L	3
NA	Core spray line bracket to RPV weld	Core Spray Bracket: 304 SST RPV: SST clad low alloy steel	SST filler of an unknown specification	1 (no fleet failures in RPV brackets)
NA	Core spray clamp tack welds.	Core Spray Clamp: 304 SST Bolt: 304 or 316 SST	SST filler of an unknown specification	2 (cracking unlikely to affect function)
P5	Connecting Sleeve to Downcomer Pipe (field weld with a creviced root)	Connecting Sleeve: 304 SST Pipe: 304 SST	SST filler of an unknown specification	5

514 520 498

FIG. 9

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534 Plant	538 Prod Line	536 Com Opr	540 Finding	532 Description	544 Cause	548 Repair
BRU2	BWR/ 4	Nov - 75	Jun - 78	Crack at upper elbow weld to horizontal header pipe (P4a)	1 GSCC	Initially welded followed by replacement of upper piping
OYC1	BWR/ 2	Dec - 69	Jun - 80	Two visual indications, 4.5 long and 3 long on 6x5 eccentric reducer @ approx. 60 deg RPV azimuth	unknown	None?
PEB3	BWR/ 4	Dec - 75	Oct - 85	Cracks (approx 180 degrees) in 6 inch laterals on both sides of 240 degree tee box junction (P3)	1 GSCC	Two brackets welded to pipes and tee box
BRU2	BWR/ 4	Nov - 75	Jan - 88	Crack in pipe (1978 replacement) at tee box junction (P3)	1 GSCC / cold work suspected	Brackets welded to pipes at tee box under water by divers
FIT1	BWR/ 4	Jan - 75	Oct - 88	180 deg crack at a weld in 190 deg vertical downcomer pipe. Weld approx 4" below pipe to elbow weld (an extra weld)	1 GSCC	Split pipe coupling welded above and below crack
BRF3	BWR/ 4	Mar - 77	Oct - 91	Crack in pipe at tee box junction (P3)	1 GSCC	Brackets welded to pipes at tee box under water by divers

FIG. 10

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For early detection of IGSCC initiated from the inside of core spray welds, which is the most likely initiation point for the creviced downcomer coupling welds (P5, P6 and P7), inspection must be by UT. Many plants are operating indefinitely under an analytical justification with periodic reinspection of known flaws. Accurate sizing is critical for the analytical evaluation of the core spray cracks. The tight cracking often seen in internal core spray welds makes UT the preferred inspection method for accurate sizing. BWRVIP-18 also allows longer reinspection intervals and reduced inspection scope with UT. Two recent developments in UT have made inspection of internal core spray piping by UT the preferred inspection method:

- Automated core spray inspection tooling, specifically designed for the internal core spray piping is now available. In one recent case this equipment performed a CSL examination in three days. This inspection tooling also permits other RPV work activities to be performed in parallel with core spray piping inspections (equipment can operate independent of the refueling bridge).

- UT inspection for the hidden P9 weld which "sees through the collar" has been qualified to the BWRVIP requirements in 1998.

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FIG. 11

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WELD ID	LOCATION	INSPECTION METHOD	LOCATION / AZIMUTH
P1	Thermal sleeve to T-box (field weld with a creviced root)	BWRVIP-18	5°, 185°
P2	T-box plug to T-box (field weld with a creviced root)	Unit 1 not required or accessible because of T-box repair clamp.	5°, 185°
P3	Pipe to T-box (field weld, unfavorable weld geometry, installation cold spring likely)	Unit 1 not required or accessible because of T-box repair clamp.	5°, 185°
P4a, b, c, d	Elbow to pipe welds (P4c & P4c shop, other field)	BWRVIP-18	81°, 289°, 109°, 261°
NA	Core spray clamp tack welds (Figure 1-5)	BWRVIP-18	65°, 125°, 245°, 305°
P5	Connecting Sleeve to Downcomer Pipe (field weld with a creviced root)	BWRVIP-18	80°, 290°, 110°, 260°
P6	Connecting Sleeve to Riser Coupling (field weld with a creviced root)	BWRVIP-18	80°, 290°, 110°, 260°

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FIG. 12

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Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Reinspections	Failure Mode/ Location of Degradation	Comments
1994	VT-1 (1 mil)	IEB 80-13/NUREG of piping and welds in annulus. 120 degree indication at P3 weld.	Indication observed during 1994 on P3 of T-box was permanently repaired in 1996	
1996	EVT-1, UT	Cracking in 260 deg and 290 deg downcomer elbow to thermal sleeve collar welds on elbow side; 260 deg had 1-4.6" indication and 290 deg had 1-3" and 1-4" adjacent indications; all indications detected by VT and confirmed with UT. (P8a)		
1998	EVT-1, UT	Inspection of all Unit 1 P4d, P8a and P8b welds discovered a new indication on the 110° P4d weld. The new indication is 2.98" between 130° and 180° on elbow side of weld.		

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FIG. 13

Core Spray Internal Piping

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Mitigation Method	Welds Mitigated	Status	Plant Implemented
Hydrogen Water Chemistry	None of the core spray internal piping welds or the core spray nozzle thermal sleeve welds are protected by feedwater hydrogen injection. It is not practical to protect these welds with an increased hydrogen level.	Developed / Implemented	Implemented at Dresden 2 & 3 to protect piping and lower plenum intervals.
Noble metal chemical addition NobleChem™ in combination with hydrogen injection	Even noble metal chemical addition in combination will not afford adequate protection to the susceptible core spray internal piping welds.	Developed / Implemented	Implemented at Dresden 2.
Noble metal coating	Theoretically possible to protect some of the core spray welds. However, the configuration of and access to core spray internal piping welds would make noble metal coating of limited practical value. To be fully effective both sides of the relatively thin core spray welds would require coating application.	Developed / Implementation in process at this time	Being implemented on the ID of foreign 2 shroud H3 and H4 welds at this time.
Noble metal cladding	Theoretically possible to protect some of the core spray welds. However, the configuration of and access to core spray internal piping welds would make noble metal cladding of limited practical value. To be fully effective both sides of the relatively thin core spray welds would require cladding.	Developed / Implementation in process at this time	Being implemented on the ID of foreign incore monitor housings welds at this time.

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FIG. 14

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Core Spray Internal Piping

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Repair method	Welds Repaired	Status	Plant Implemented
Welded repair clamps	P3 pipe to T-box and individual elbow to pipe welds	Developed / Implemented	Several (not a permanent repair)
Local mechanical repair clamps		Developed / Implemented	Dresden and others (not a permanent repair)
Lower sectional replacement		Developed / Implemented	One core spray downcomer at Browns Ferry 3
Full core spray line replacement	All	Some development required	Several BWRs currently pursuing, but no BWR has yet implemented

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FIG. 15

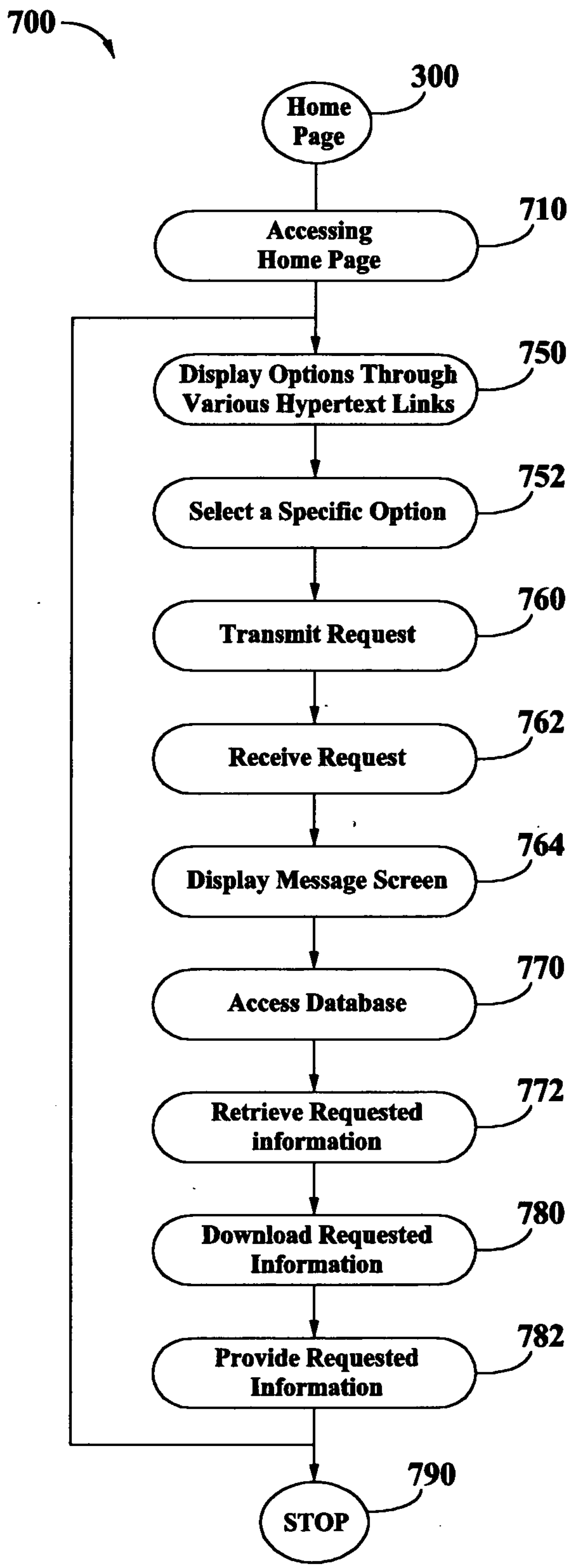
700
300
Home Page
710
Accessing Home Page
750
Display Options Through Various Hypertext Links
752
Select a Specific Option
760
Transmit Request
762
Receive Request
764
Display Message Screen
770
Access Database
772
Retrieve Requested information
780
Download Requested Information
782
Provide Requested Information
790
STOP

FIG. 16